

Executive Office of Energy and Environmental Affairs

CLIMATE CHANGE ADAPTATION ADVISORY COMMITTEE

Meeting 1: June 4, 2009

TABLE OF CONTENTS

AAC1 – Meeting #1 Agenda

AAC2 – Charge of the Adaptation Advisory Committee

AAC3 – Advisory Committee Workplan and Schedule

AAC4 – Advisory Committee Member Biographies

AAC1 – Meeting #1 Agenda

Executive Office of Energy and Environmental Affairs

CLIMATE CHANGE ADAPTATION ADVISORY COMMITTEE

Meeting 1: June 4, 2009

1:00 pm – 3:00 pm

- | | |
|---|------------|
| 1. Introduction and opening remarks | 15 minutes |
| <ul style="list-style-type: none">• EEA Secretary, Ian Bowles• EEA Undersecretary and Committee Chairman David Cash• Introductions by Committee members | |
| 2. Summary of predicted climate change in Massachusetts | 15 minutes |
| 3. Committee overview | 15 minutes |
| <ul style="list-style-type: none">• Charge of the Adaptation Advisory Committee (Document AAC2)• Advisory Committee Workplan and Schedule (Document AAC3) | |
| 4. Adapting to Climate Change in Massachusetts | 60 minutes |
| <ul style="list-style-type: none">• Issues to consider: vulnerability; risk and strategies | |
| 5. Next steps | 15 minutes |

Dates for next Advisory Committee Meetings:

July 30, 2009 from 1:00 pm – 3:00 pm

September 9, 2009 from 1:00 pm – 3:00 pm

October 20, 2009 from 1:00 pm – 3:00 pm

AAC2 - Charge of the Adaptation Advisory Committee

The Climate Change Adaptation Advisory Committee was created as a result of Chapter 298 of the Acts of 2008, An Act Establishing the Global Warming Solutions Act, which required:

SECTION 9. *Notwithstanding any general or special law to the contrary, the secretary shall convene an advisory committee to analyze strategies for adapting to the predicted impacts of climate change in the commonwealth. The advisory committee shall be chaired by the secretary, or his designee, and comprised of representatives with expertise in the following areas: transportation and built infrastructure; commercial, industrial and manufacturing activities; low income consumers; energy generation and distribution; land conservation; water supply and quality; recreation; ecosystems dynamics; coastal zone and oceans; rivers and wetlands; and local government.*

The committee shall file a report of its findings and recommendations regarding strategies for adapting to climate change not later than December 31, 2009.

The Climate Change Adaptation Advisory Committee will advise the Executive Office of Energy and Environmental Affairs on the range of options available to the Commonwealth for adapting to predicted impacts from climate change.

Interaction between the Climate Adaptation Advisory Committee and the Climate Protection and Green Economy Advisory Committee

In addition to establishing the Climate Change Adaptation Advisory Committee, the Global Warming Solutions Act (GWSA), requires that economy-wide greenhouse gas emissions are reduced 80 percent from 1990 levels by 2050, and calls on the Executive Office of Energy and Environmental Affairs to set a 2020 target between 10 and 25 percent below 1990 levels, and to develop a plan for achieving that reduction. Furthermore, the Act calls upon the Secretary to adopt interim emissions limits for 2030 and 2040.

The Climate Protection and Green Economy Advisory Committee, established by the Act, will advise the Executive Office of Energy and Environmental Affairs as it develops the Commonwealth's economy-wide plan to meet the goals and deadlines for reducing greenhouse gas emissions that are set out in the Act. The Committee will advise the Commonwealth on how best to achieve these goals through strategies that both combat climate change and drive job creation and economic prosperity.

There will be overlap between the two GWSA advisory committees, including some of the committees' members, the technical and policy disciplines being addressed, and the tools and resources used in analyses. To take advantage of complementarities in possible policies and to avoid unintended consequences, agency staff will work together to coordinate these two efforts. This will involve ongoing communication between staff, the sharing of reports and documents, and the inclusion and attendance of representatives from each committee at the other's internal planning

meetings and advisory committee meetings. In addition, each committee will seek comments and recommendations from the other committee on issues such as common strategies (i.e. those strategies that address both mitigation and adaptation) as well as areas of potential conflict. A coordinated effort will ensure consistency between the committees and enhance their efficiencies and effectiveness.

AAC3 - Advisory Committee Workplan and Schedule

Scope of analysis

- Define and assess potential vulnerabilities due to predicted impacts of climate change
- Identify possible strategies to build resilience or encourage adaptation to predicted impacts of climate change, including analysis of costs, benefits, challenges, interaction with mitigation strategies, and possible green economy impacts.

Topic areas for technical subcommittees

- Local Economy
- Natural Resources and Habitat
- Human Health and Welfare
- Key Infrastructure
- Coastal Zone and Ocean

Technical Subcommittees

Advisory Committee members are encouraged to participate in one or more subcommittees, staffed by state agencies. Each subcommittee will invite public participation as well. Subcommittees and their chairmen are listed below. As subcommittee work sessions are scheduled, we will update members and staff via email and the Climate Change Adaptation Advisory Committee webpage, hosted by the Massachusetts Department of Environmental Protection.

NATURAL RESOURCES and HABITAT		
Chair	Jack Buckley, DFG	Jack.Buckley@state.ma.us
ISSUE	MEMBER	AFFILIATION
Ecosystem Dynamics	Hector Galbraith, PhD	Manomet Center
Rivers and Wetlands	Bob Zimmerman	Charles River Watershed Assn
	Peter Weiskel	U. S. Geological Survey
Forestry	Laura Johnson	MA Audubon Society
	David Foster	Harvard Forest
Land Conservation	Wayne Klockner	The Nature Conservancy
	Bernie McHugh	MA Land Trust Coalition
General	Erika Spanger-Seigfried and Melanie Fitzpatrick	Union of Concerned Scientists

LOCAL ECONOMY		
Chair: TBD		
ISSUE	MEMBER	AFFILIATION
Local Government	Carl Spector	City of Boston, Energy & Environmental Services
	Paul Niedzwiecki	Cape Cod Commission
	Nathaniel Karns	Berkshire Regional Planning Commission
	Kim Lundgren	ICLEI
Commercial, Industrial and Manufacturing	Robert Rio	Associated Industries of Massachusetts
Recreation	Brian Fairbank	Jiminy Peak Mountain Resort/EOS Ventures
	Wendy Northcross	Cape Cod Chamber of Commerce
Insurance	Karen O' Reilly	Lexington Insurance Company
	Al Niederfringer	Travelers Insurance

HUMAN HEALTH AND WELFARE		
Chair	Ann Lowery, DEP	Ann.Lowery@state.ma.us
ISSUE	MEMBER	AFFILIATION
Public Health	Paul Epstein, MD	Harvard Medical School
Agriculture	Timothy Griffin	Tufts University
	Andrew Cavanagh	University of Massachusetts - Amherst
Low Income Consumers	Gene Benson	Alternatives for Community & Environment
	Roseann Bongiovanni	Chelsea Greenspace and Recreation Committee
NE States	Arthur Marin	Northeast States Center for a Clean Air Future

KEY INFRASTRUCTURE		
Chair	Ed Kunce, DEP	Ed.Kunce@state.ma.us
ISSUE	MEMBER	AFFILIATION
Water Supply and Quality	Raymond Jack	Massachusetts Water Works Association
	Jeff Reade	AECOM
	Norm Willard	U.S. Environmental Protection Agency
Transportation and Built Infrastructure	Marc Draisen	Metropolitan Area Planning Council
	Tamara Small	NAIOP
Energy Generation and Distribution	Angela O'Connor	New England Power Generators Association, Inc.
	Alexander Taft	National Grid
Public Safety	Don Boyce	Massachusetts Emergency Management Agency
Solid and Hazardous Waste		
Dam Safety		

COASTAL ZONE AND OCEAN		
Chair	Bruce Carlisle, CZM	Bruce.Carlisle@state.ma.us
ISSUE	MEMBER	AFFILIATION
Ecosystem Dynamics	Hector Galbraith, PhD	Manomet Center
Coastal Zone and Ocean	Bud Ris	The New England Aquarium
	John Ramsey	Applied Coastal Research and Engineering, Inc.
	Donald Anderson	Woods Hole Oceanographic Institution
Other (Modeling)	Paul Kirshen	Tufts University
	Bill Moomaw	Fletcher School, Tufts University

DRAFT Timeline

Date	Milestones
June	
4	1 st CCAAC Meeting
June 8 through Aug 7 (see page 9 for details)	Subcommittee Meetings (~ 3-4 meetings per subcommittee)
	Develop draft chapters
11	Public Information Session: Worcester, MA
24	Public Information Session: Barnstable, MA
30	Public Information Session: Wilmington, MA
July	
1	Public Information Session: Springfield, MA
2	Public Information Session: Lakeville, MA
30	2 nd Full CCAAC Meeting Discuss subcommittee progress (i.e. anticipated contents of chapters) and comments received at public hearing sessions
August	
7	Subcommittee members submit components of drafts to subcommittee chairs
14	Subcommittee chairs deliver chapter drafts to EEA
September	
3	Chapter drafts to CCAAC members
9	Full CCAAC Meeting #3 Discuss chapter drafts
15	Complete draft report, address comments from CCAAC; and distribute to CCAAC
October	
20	Last CCAAC meeting CCAAC offers final comments on draft final report
November	
	Internal EOEEA report review
December	
15	Report delivered to printer for production
31	Report delivered to the Legislature

Subcommittee Meetings

June 8 to August 7

Meeting 1	Review Task Sheet Add other issues based on comments from members Present ongoing efforts Exchange references/resources Discussion of vulnerabilities, consequences Discussion of strategies: short-term, long-term Share evaluation criteria
Meeting 2	Share additional references/resources Presents results of research Preliminary drafts (created by completing task sheets) Identify gaps Discuss and select/screen vulnerabilities; consequences; strategies
Meeting 3	Committee reviews/discusses final draft

AAC4 – Advisory Committee Member Biographies

DAVID CASH, PH.D., CHAIR

David Cash serves as the Assistant Secretary for Policy in the Massachusetts Executive Office of Energy and Environmental Affairs (EEA). In this role, Dr. Cash advises the Secretary of Energy and Environment on a wide array of issues including energy and clean energy sector development, land management, water management, oceans, wildlife and fisheries, air and water quality, climate change, environmental and energy dimensions of transportation, and waste management. The Assistant Secretary works across agencies (e.g., with transportation and economic development agencies) to develop and analyze policy options to further EEA's mission. Prior to working for the Commonwealth, Dr. Cash was a research associate at the John F. Kennedy School of Government at Harvard University in Cambridge, and a Lecturer in Environmental Science and Public Policy. He received a Ph.D. in Public Policy from the Kennedy School in 2001.

DON ANDERSON, PH.D.

Don Anderson is a Senior Scientist in the Biology Department of the Woods Hole Oceanographic Institution. He earned three degrees from MIT – a BS in Mechanical Engineering in 1970, and a MS (1975) and PhD in Civil and Environmental Engineering in 1977. He joined the scientific staff at WHOI in 1978. In 1993, he was awarded the Stanley W. Watson Chair for Excellence in Oceanography, in 1999 was named a NOAA Environmental Hero, and in 2006 received the Yasumoto Lifetime Achievement Award from the International Society for the Study of Harmful Algae (ISSHA). Anderson's research focus is on toxic or harmful algal blooms (HABs), commonly called "red tides". His research ranges from molecular and cellular studies of toxin genetics and regulation to the large-scale oceanography and ecology of the "blooms" of these microorganisms. Along with an active field and laboratory research program ranging from molecular and genetic studies to large-scale oceanographic surveys, Anderson is heavily involved in national and international program development for research, monitoring, and training on red tides, marine biotoxins, and harmful algal blooms. He has testified several times before Congressional committees, and has been actively involved in legislation and appropriations related to HABs and hypoxia. He serves as Director of the *U.S. National Office for Marine Biotoxins and Harmful Algal Blooms*, located at the Woods Hole Oceanographic Institution. He is also an advisor to several foreign countries and international aid organizations on red tides, algal blooms, and HABs. Anderson is the author, co-author, or editor of over 230 scientific papers and 12 books.

EUGENE B. BENSON

Eugene B. Benson is Legal Counsel and Services Program Director at Alternatives for Community & Environment (ACE), Roxbury, MA, where he provides legal counsel and representation for community groups and coalitions on environment, development, and energy matters. Gene's earlier work includes Associate General Counsel, Environmental Law, Massachusetts Water Resources Authority; Deputy General Counsel, Massachusetts Department of Public Welfare; and Executive Director, Cambridge and Somerville Legal Services. Gene was a Givelber Distinguished Lecturer in Public Interest Law at Northeastern University School of Law, where he taught Environmental Justice and has written and presented about environmental justice and environmental law often. Gene is on the Board of Trustees of The Food Project and the Board of Directors of Move Massachusetts, chaired the Boston Bar Association Environmental Law Section, where he

is now on its Steering Committee, and is past president of the Mystic River Watershed Association. Gene received his J.D. from Georgetown University Law Center.

ROSEANN BONGIOVANNI

Roseann Bongiovanni is Associate Executive Director of the non-profit Chelsea Collaborative, Inc. and the Program Director of the Chelsea Green Space and Recreation Committee, the grassroots environmental justice arm of the Collaborative. She is an At-Large City Councilor and was the President of that body in 2007. Roseann has a Bachelor of Arts from Boston University and was awarded the Dean's Scholarship to attend the Boston University School of Public Health where she earned a Master's Degree concentrating in Environmental Health. Roseann was a recipient of the ACE Founders' Award in 2001; and the National Oceanic and Atmospheric Administration named her one of 10 National Environmental Heroes in the Spring of 2006; and she was awarded the All Chelsea Award "Adult Resident of the Year" in 2007. She has been a guest speaker at the University of Massachusetts, Boston, Massachusetts Institute of Technology, Salem State School of Social Work, Boston University School of Social Work, Boston University Law School and numerous conferences.

DON BOYCE

Don Boyce was appointed Director of the Massachusetts Emergency Management Agency (MEMA) following careers in the private and public sector. Prior to MEMA, He served as the Corporate Director of Emergency Management for Continuum Health Partners, Inc., responsible for planning and oversight of emergency management activities for a multi-hospital and ambulatory care network in New York City. Mr. Boyce also provided emergency management planning and consulting for government and proprietary clients in his role as Senior Associate for Kroll, Inc. He served as the Deputy Director for Labor Relations and as Director of the Special Investigations Unit for the New York City Fire Department. Mr. Boyce also served in various assignments with the New York City Emergency Medical Service, including Special Assistant to the Medical Director, Senior Instructor Coordinator for the Division of Training and as Citywide Tactical Patrol Paramedic. His many responsibilities as the MEMA Director include leading the Massachusetts Emergency Management Team, serving as Chair for the State Emergency Response Commission (SERC), and as State Liaison Officer to the Nuclear Regulatory Commission (NRC). He serves as a member of the Board of the Northeast States Emergency Consortium (NESEC) and the National Emergency Management Association (NEMA). Mr. Boyce graduated with a bachelor of science from St. Francis College in Brooklyn, NY, and his Juris Doctorate from Brooklyn Law School.

ANDREW CAVANAGH

Andrew Cavanagh has worked with the UMass Extension Vegetable Team since 2003. Much of his work has been in pest management, particularly insects & diseases of vine crops, but more recently has branched out into working with renewable energy and conservation on the farm. He is currently working on a project that creates networks between local producers and users of shelled corn for biomass fuel, and exploring the environmental and economic sustainability of locally produced shelled corn as a fuel source for greenhouse heat.

MARC DRAISEN

A lifelong resident of the Boston region, Marc Draisen brings public policy, housing, and economic development experience to the position of Executive Director of the Metropolitan Area Planning Council

(MAPC). Mr. Draisen served two terms in the Massachusetts House of Representatives, where he represented neighborhoods in Boston and Brookline. He also worked for eight years as President and CEO of the Massachusetts Association of Community Development Corporations (MACDC), the trade association for 70 non-profit community-based developers. Mr. Draisen's housing expertise also stems from his years as Executive Director of the Citizens' Housing and Planning Association (CHAPA) and Director of Private Housing at the Executive Office of Communities and Development.

MAPC is the regional planning agency for the people who live and work in the 101 cities and towns of Metro Boston. With several partners and more than 4,500 participants from across the region, it is completing MetroFuture, a comprehensive, smart growth plan for the region's growth and development through 2030. MAPC also serves on the Boston Metropolitan Planning Organization, acts as the region's Economic Development District, and provides a wide array of technical and planning services to municipal governments and non-profit agencies.

PAUL R. EPSTEIN, M.D., M.P.H.

Paul R. Epstein is Associate Director of the Center for Health and the Global Environment at Harvard Medical School (<http://chge.med.harvard.edu>) and is a medical doctor trained in tropical public health. Paul has worked in medical, teaching and research capacities in Africa, Asia and Latin America and in 1993, coordinated an eight-part series on Health and Climate Change for the British medical journal, Lancet. He has worked with the Intergovernmental Panel on Climate Change (IPCC), the National Academy of Sciences (NAS), the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA) to assess the health impacts of climate change and develop health applications of climate forecasting and remote sensing.

Dr. Epstein also served as a reviewer for the Health chapter of the Millennium Ecosystem Assessment and coordinated *Climate Change Futures: Health, Ecological and Economic Dimensions*, an international project with Swiss Re and the United Nations Development Programme assessing the new risks and opportunities presented by a changing climate. He has also prepared the report *Healthy Solutions for the Low Carbon Economy: Guidelines for Investors, Insurers and Policy Makers* that examines the "stabilization wedges" through the lens of health and ecological safety.

Paul has coordinated two Cat Modeling Forums with A.I.G., Lloyd's of London and other insurers and insurance brokers, facilitating integration of dynamic and statistical models for better risk assessment and reduction. Paul received recognition for his contributions to the work of the Intergovernmental Panel on Climate Change, awarded the Nobel Peace Prize in 2007.

BRIAN H. FAIRBANK

Brian H. Fairbank serves as President and CEO of Jiminy Peak, Inc. Brian has been with Jiminy for 37 years and is a 50% owner of the company. He has overseen \$100,000,000 in real estate development including the completion of Jiminy's 21 year master plan, raising the overnight accommodations to 2000 beds on the resort campus. Total numbers of employees is 900 in winter with 130 year-round employees.

Jiminy Peak is a four-season mountain resort generating \$20,000,000 in revenue annually. The resort features 7 chairlifts, including Massachusetts's only 6 passenger, high-speed detachable. In the warmer months, the resort has grown to include Mountain Adventure Park, featuring a European Mountain Coaster, 1 of only 2 to be built in the US. 2007 featured a brand new Alpine Super Slide.

Within the ski industry there are few who can rival the accomplishments of Fairbank- he is a former Director and Chairman of the National Ski Areas Association (NSAA) and a past recipient of the Sherman Adams award recognizing his devotion and leadership in the industry. Instrumental in forming Mountains of Distinction consisting of 20 independent ski resorts, Fairbank brought an early focus to teaching skiing to younger students encouraging a lifetime love for skiing- great for kids, and great for the industry. Brian is a lifetime member of the Professional Ski Instructors of America and was an examiner for 15 years.

Environmental issues are always in the forefront of the minds of the ski industry; such as Global warming, fossil fuels, and preserving the pristine environment for skiers and riders alike. Jiminy Peak has instituted resort-wide standards to help sustain or improve our environment for future generations. Two specific projects lead the effort. Arguably, Jiminy has the most energy efficient snow making in North America. In 1990, Fairbank had a clear picture focusing on the snowmaking side of the resort. Collaborating on what is referred to as the “Pentti Head”, a patented snow making system, the air to water ratio is the best in the business. The most ambitious project was installation of the only 1.5 Megawatt wind turbine at a mountain resort in North America, possibly the world. The turbine was commissioned on August 15th, 2007. With energy costs in the millions already, Fairbank hopes that not only will the wind power keep costs down, but help to keep our natural resources preserved for future generations to come.

In his “free” time outside of the ski industry, Fairbank serves on the Board of Directors of Berkshire Health Systems and Hospice Care of the Berkshires and has been a Town Moderator in Hancock for over 30 years. He also serves on the board of the National Ski and Snowboard Hall of Fame.

MELANIE FITZPATRICK, PH.D.

Dr. Melanie Fitzpatrick is a Climate Scientist with the Union of Concerned Scientists in Cambridge, Massachusetts. An expert in polar research, Dr Fitzpatrick completed her Bachelor’s degree in Physics University of Sydney and the Australian National University in Canberra, and her PhD in Geophysics at the University of Washington in Seattle researching the interaction between sea ice, clouds and climate. Dr Fitzpatrick worked for many years with the Australian Antarctic Program, and in Earth and Space Sciences at the University of Washington in Seattle. Over the last fifteen years she has conducted and supported various global change science programs in Antarctica, and spent time in Greenland and Alaska. She was an expert reviewer for the Nobel-prize winning United Nations IPCC climate reports, assessing both reports in 2001 and 2007. Her interests cover basic climate research, local and global impacts, and the communication of these findings to policymakers and the general public. Recently, Dr Fitzpatrick coordinated a new climate impacts report on Pennsylvania, detailing the changes expected for the state’s forests, cities, winter snow cover, and agriculture. She is currently the Project Manager for a new report on climate impacts in the Midwest.

DAVID R. FOSTER, PH.D.

David is an ecologist and author of *Thoreau’s Country – Journey through a Transformed Landscape* (1999), *New England Forests Through Time* (2000; both Harvard University Press), *Forests in Time – The Environmental Consequences of 1000 years of Change in New England* (2004; Yale University Press) and *Wildland and Woodlands: A Vision for the Forests of Massachusetts* (Harvard University). He has been a faculty member in Biology since 1983 and is Director of the Harvard Forest, Harvard University’s 3500-acre ecological laboratory and classroom in central Massachusetts. David is the Principal Investigator for the

Harvard Forest Long Term Ecological Research program, sponsored by the National Science Foundation and involving more than 100 scientists and students investigating the dynamics of New England landscape as a consequence of climate change, human activity, and natural disturbance.

David has a Ph.D. in ecology from the University of Minnesota and has conducted studies in the boreal forests of Labrador, Sweden and Norway and the forests of Puerto Rico, the Yucatan, and Patagonia in addition to his primary research on landscape dynamics in New England. His interests focus on understanding the historical changes in forest ecosystems that result from human and natural disturbance and applying these results to the conservation and management of natural and cultural landscapes. He currently serves on the boards of The Nature Conservancy -Massachusetts, Trustees of Reservations, Conservation Research Foundation and Highstead Foundation. As part of his larger conservation work David and a group of Harvard Forest researchers developed Wildlands and Woodlands – A Vision for the Forests of Massachusetts, which lays out an ambitious plan for the protection and conservation of half of the land in the state. At Harvard University David teaches courses on forest ecology and environmental change and directs the graduate program in forest biology. He lives in Shutesbury, Massachusetts with his wife Marianne Jorgensen and their children Christian and Ava.

HECTOR GALBRAITH, PH.D.

Although his original training and qualifications were in animal ecology, Dr. Galbraith's current area of scientific expertise is in the impact of climate change on animal and plant populations and communities. He has published a number of papers and book chapters on this topic area, and has carried out numerous research projects for federal and other agencies reviewing the likely impacts of global climate change on ecosystems. These have included: evaluating the potential of sea level rise on coastal ecosystems; how dams in California's Central Valley may help mitigate the effects of climate change on cold water salmonids; evaluating how climate change might affect services provided by ecosystems in California and Arizona; developing an analytical framework for assessing the vulnerabilities of species to climate change; and predicting the potential impacts of climate change on alpine tundra habitats and animals in the United States. He has written a major report for the PEW Charitable Trust on the observed effects of climate change and is currently performing studies on major shorebird migration sites and assisting the Massachusetts Division of Fish and Wildlife adapt their State Wildlife Action Plan to climate change.

Dr. Galbraith is Director of the Manomet Center for Conservation Science's Climate Change Initiative.

TIMOTHY S. GRIFFIN, PH. D.

Tim Griffin is Associate Professor and Director of the Agriculture, Food and the Environment program at Tufts University. Before coming to the Friedman School in 2008, he was Research Agronomist with USDA-Agriculture Research Service in Orono, ME, from 2000 to 2008. He conducted research on many aspects of agricultural production in the Northeast U.S., including nutrient cycling and grain production on organic dairy farms, crop management and long-term sustainability of high-value production systems. Dr. Griffin also initiated research in greenhouse gas emissions, soil carbon and nitrogen cycling, and soil conservation in these systems. From 1992 to 2000, Dr. Griffin was Extension Sustainable Agriculture Specialist with the University of Maine, the first such position in the U.S. He developed and delivered a wide-ranging educational and applied-research program on crop production, nutrient availability, and crop-livestock integration, and worked extensively with the USDA-Sustainable Agriculture Research and Education program in the

Northeast. Dr. Griffin has published extensively in many peer-reviewed journals, and brings perspective from more than 25 years of field research and agricultural education to the Friedman School. Dr. Griffin's general research interests include the intersection of agriculture and the environment, and the development and implementation of sustainable production systems. Currently he is researching the environmental impacts of agriculture (nutrient flows, carbon retention and loss, and climate change), and impacts of policy on adoption of agricultural practices and systems.

RAYMOND A. JACK

Raymond A. Jack serves as Director of Public Works for Falmouth, MA. He is a Certified Public Works Manager through Rutgers University, Government Division with over 30 years experience in public works administration and holds water system licenses in Massachusetts as well as water and wastewater licenses in New Jersey. Mr. Jack is an adjunct professor at Cape Cod Community College where he teaches water science courses as part of their Environmental Science degree program and is past-president of the Massachusetts Water Works Association. His focus is on development of holistic, integrated, cost-effective solutions for future environmental and cultural sustainability.

LAURA JOHNSON

Laura A. Johnson became President of Mass Audubon in 1999. Prior to joining the organization, she served as the Division Vice President, Northeast Division, of the The Nature Conservancy. This position was the culmination of a sixteen-year career with The Nature Conservancy that began in 1982 with a position as a staff attorney. Ms. Johnson was an Associate with Palmer & Dodge in Boston before beginning her career at The Nature Conservancy. Ms. Johnson graduated from Radcliffe College, Harvard University, and received a J.D. degree from the New York University School of Law, where she was a member of the New York University Law Review. In addition to her duties as President of Mass Audubon, Ms. Johnson serves as a trustee of the Century Funds in Boston and is a member of the Corporation of the Woods Hole Oceanographic Institute. She was a trustee of The Winsor School from 1990-1996 and a member of its corporation, a trustee of the Fenn School in Concord MA from 2001-2007, and a director of the Mount Auburn Cemetery.

NATHANIEL WILSON KARNS, AICP

Work Experience

August 1994 - Present: Executive Director, Berkshire Regional Planning Commission, Pittsfield, Massachusetts.

August 1992 - August 1994: Assistant Director of Planning, County of Henrico, Richmond, Virginia.

May 1988 - July 1992: Chief Planner, City of Hampton, Virginia.

March 1984 - May 1988: City Planner, City of Poquoson, Virginia.

September 1981 - March 1984: Planner I, Department of Planning & Community Development, York County, Yorktown, Virginia.

October 1978 – September 1981: Senior Area Planner, Area Planner, Central Midlands Regional Planning Council, Columbia, South Carolina.

Education

Master of Science in Planning: Graduate School of Planning, University of Tennessee, Knoxville, August 1979.

Bachelor of Arts: American Government, University of Virginia, May 1974. Degree awarded with distinction.

Offices and Memberships

Berkshire Economic Development Corporation, Board of Directors (2005-present)

Berkshire Regional Competitiveness Council, Member (2003-2006)

Berkshire Connect, Inc., Board of Directors & Treasurer (2003-present)

Berkshire Housing Development Corp., Board of Directors (1994-2003, 2004-present)

Mount Greylock Regional High School Building Committee, Member (2005-present)

Sustaining Educational Excellence Fund, Board of Directors (2006-present)

American Institute of Certified Planners (1981-present)

American Planning Association (1976-present)

Virginia Chapter, American Planning Association: Past President (1992-1994), President (1990-1992), Treasurer (1988-1990), and Secretary (1986-1988)

PAUL KIRSHEN, PH.D.

Paul H. Kirshen is a Research Leader, providing consulting and research on climate change adaptation and water resources management at Battelle Memorial Institute. Prior to his employment at Battelle, Dr. Kirshen was the Director and Co-founder of the Water: Systems, Science, and Society (WSSS) Interdisciplinary Graduate Education Program at Tufts University.

One of four Co-Directors of the Tufts Institute of the Environment (TIE, the coordinating organization for environmental research and education at Tufts University), Dr. Kirshen was a Research Professor in the Civil and Environmental Engineering Department, Affiliated Faculty in the Department of Urban and Environmental Policy and Planning, and Adjunct Professor at the Friedman School of Nutrition Science and Policy. Dr. Kirshen conducts research in developed and developing countries on integrated water resources management, climate change impacts and adaptation, water resources operations, decision support systems, public health, coastal watersheds, and urban water systems. He holds Ph.D. and M.S. degrees in Civil Engineering from the Division of Water Resources of the Massachusetts Institute of Technology and a Sc.B. degree in Engineering from Brown University.

WAYNE KLOCKNER

Wayne Klockner is a Vice President of The Nature Conservancy and its State Director for Massachusetts. Wayne joined the Massachusetts Chapter in 1999 after four years with the Conservancy's Asia Pacific Program, the last three of those as Senior Advisor in Indonesia.

With a degree in biology and environmental planning, Wayne began his conservation career as a biologist for the Maryland Department of Natural Resources in 1975. His first work for The Nature Conservancy was in the Maryland/Delaware Office from 1981 to 1988, where he held various positions including Delaware Field Representative, Natural Areas Registry Director, and Assistant State Director.

In 1988 he moved to Rochester, NY to open The Nature Conservancy's first office in Central and Western New York as the Central/Western New York Chapter Director. He then returned to Maryland in 1990 as that chapter's second State Director. Wayne helped to raise over \$10 million in public and private funds for natural areas preservation and developed two major landscape-scale conservation projects in Maryland.

As Senior Advisor to the Conservancy's Indonesia Program from 1996 to 1999, Wayne shepherded the Conservancy through a period of significant expansion of TNC's efforts to preserve Indonesia's biodiversity, including the establishment of a new national non-governmental organization (NGO) devoted to biodiversity conservation.

Since joining the Massachusetts Chapter, Wayne has led staff and volunteers in its most successful capital campaign ever, \$61 million of private funds raised in just 18 months for conservation across the Commonwealth. Other accomplishments include the launch of new landscape conservation programs in the Plymouth Pinelands and the Westfield River Highlands and the establishment of the Chapter's marine conservation program.

In 2008, Wayne was on special assignment, serving as leader for TNC's Global Climate Change Strategy team.

KIM LUNDGREN

As the U.S. Services Director for ICLEI USA, Kim Lundgren oversees all of the membership services and the regional offices. In this capacity, Kim establishes service standards and protocols, creates new membership engagement opportunities, and facilitates the growth of ICLEI's Regional Office Model. Kim joined ICLEI in 2005, as the Northeast and Mid-Atlantic Regional Director, to open ICLEI's first regional office in Boston, MA. During that time, she grew the office to its current five full time staff and supported a doubling of the membership in the region. Before joining ICLEI, she was the Director of the City of Medford's Energy & Environment Department where she was responsible for all energy efficiency and environmental initiatives in the City, including the development and implementation of the City's Climate Action Plan. Through this plan the City reduced emissions of greenhouse gases and criteria air pollutants through various measures related to buildings, transportation, lighting, clean energy installation, and education.

ARTHUR MARIN

Mr. Marin has been the Executive Director of Northeast States for Coordinated Air Use Management (NESCAUM) since 2005 and served as Deputy Director from 1995 through 2004. NESCAUM is the association of state air pollution control agencies representing the six New England states, New Jersey and New York. NESCAUM provides technical assistance and policy guidance to its member states on a broad range of issues related to air quality, energy and climate change. Arthur oversees all aspects of the organization's day-to-day operations; represents the member states in regional, national and international forums; and maintains liaisons with federal agencies, other regional organizations, industry and the environmental community. Arthur has worked with Canadian officials on environmental issues for many years, including initiatives through the New England Governors and Eastern Canadian Premiers. Mr. Marin is currently coordinating an effort among leadership states from across the U.S. interested in more effectively engaging in the development of sound national climate change policy based on a strong state-federal partnership model. Arthur also played a key role in facilitating the development of the Climate Registry. Arthur holds a Masters in Public Administration with a focus on environmental growth management. Prior

to joining NESCAUM, he worked on air quality and transportation issues with the Massachusetts Department of Environmental Protection, the Florida Department of Transportation, and for a private consulting firm.

BERNIE MCHUGH

Bernie McHugh is a successful businessman who has served as Coordinator of the Mass. Land Trust Coalition for 10 years. He has served as a Board Member of numerous conservation groups and non-profits, including Sudbury Valley Trustees and Manomet Center for Conservation Sciences. He currently serves on the Boards of the Environmental League of Mass., the Mass. Outdoor Heritage Foundation and Rialto Arts. He is also a Massachusetts delegate to the National Wildlife Federation and an advisor to the William P. Wharton Trust. He was named the "Citizen Activist of the Year" in 2003 by the Environmental League of Mass., received the LeBaron Briggs Conservation Award from the Wildlands Trust in 2007 and, along with Secretary Bowles, was recognized as a 2008 "Conservationist of the Year" by the Mass. Chapter of The Nature Conservancy.

WILLIAM MOOMAW, PH.D.

William Moomaw is Professor of International Environmental Policy at the Fletcher School of Law and Diplomacy, Tufts University, where he is the founding director of the Center for International Environment and Resource Policy, the Tufts Climate Initiative and co-founder of the Global Development and Environment Institute. He graduated from Williams in 1959, and is a physical chemist with a PhD from MIT. He works to translate science and technology into policy terms using interdisciplinary tools. His major publications are on climate change, energy policy, nitrogen pollution, forestry financing and management and on theoretical topics such as the Environmental Kuznets Curve. He was a convening lead author of the 2001 Intergovernmental Panel on Climate Change chapter on greenhouse gas emissions reduction, and for the special report on renewable energy due in 2010. He was a lead author of three other IPCC reports (1995, 2005 and 2007). The work of the IPCC was recognized with the 2007 Nobel Peace Prize. He also was an author for the Millennium Ecosystem Assessment on nitrogen and serves on the Integrated Nitrogen Committee of the EPA Science Advisory board. He was the first director of the Climate, Energy and Pollution program at the World Resources Institute, and directed the Center for Environmental Studies at Williams College where he held an endowed chair in chemistry. He has received Teaching Awards at both Williams and at The Fletcher School, and an Honorary Doctorate from the University of Belgrade for his work on sustainable development. As a AAAS Congressional Science Fellow, he worked on legislation that eliminated American use of CFCs in spray cans to protect the ozone layer, and also worked on energy and forestry legislation. Dr. Moomaw currently serves on the Board of Directors of The Climate Group, Clean Air-Cool Planet (which he co-founded), Earthwatch Institute, Center for Ecological Technologies and the Consensus Building Institute. He has facilitated sessions with negotiators of international treaties.

ALAN NIEDERFRINGER

Alan Niederfringer is a 2nd Vice President in Risk Control at Travelers. Mr. Niederfringer has been in risk control for the commercial insurance industry for over 30 years and currently has oversight for Risk Control specialists in the areas of Property, Inland Marine, Agribusiness, Ocean Marine, Product Liability and Transportation at Travelers. Climate and Environmental activities include Member of Travelers Enterprise *Committee on Climate, Energy & the Environment*; Committee member for CERES/Heinz Center *Resilient Coast Initiative* as part of Travelers private sector sponsor team; Involvement with Travelers committees supporting IBHS (Institute for Business & Home Safety); Management leadership for Travelers Risk Control *Green Building Working Group*, *Alternative Energy Working Group*; and Management leadership for various climate and

environmental initiatives including customer webinars, business continuity safety academies, website customer resources, and newsletters.

PAUL NIEDZWIECKI

Mr. Niedzwiecki is the Executive Director of the Cape Cod Commission. Formerly he was the assistant town manager in Barnstable and worked for the Massachusetts Water Resources Authority.

WENDY K. NORTHCROSS, CCE

Wendy is Chief Executive Officer of the Cape Cod Chamber of Commerce and has been with that organization since 1997. Northcross served eight years as the Executive Director of the Hyannis Area Chamber and left that organization to help start up Coastal Community Capital, a community development financial institution providing loans and technical assistance to those who create jobs and businesses. In 1998, Coastal Community Capital and the Cape Cod Chamber became "sister corporations".

Northcross received her Certified Chamber Executive (CCE) designation in 2004 from the American Association of Chamber of Commerce Executives (ACCE). She is a 1995 graduate of the U.S. Chamber Institutes for Organization Management (IOM). She is a recipient of the Ford Foundation Fellowship for Sustainable Economic Development, a year-long course of study currently underway.

ANGELA O'CONNOR

Angela O'Connor is president of New England Power Generators Association (NEPGA), the largest trade association representing electric power generators throughout New England. As President, O'Connor provides strategic leadership to the association, and is the chief spokesperson for owners and operators of electric generating infrastructure in the region.

Under O'Connor's leadership NEPGA is championing its primary policy goals of promoting competitive markets to achieve reliable and affordable energy for business and consumers, balancing energy policy with sound environmental policy, and furthering the job growth and economic development necessary for a healthy New England economy.

O'Connor's focus in these efforts includes working to insure that cost effective and reliable supplies of electricity exist that are a vital component in our economy, and as electric power needs continue to grow in New England. In her capacity as president of NEPGA, she works closely with all stakeholders involved with these issues seeking to be part of the solution to successfully servicing families and businesses throughout New England.

Prior to becoming president of NEPGA, O'Connor served as Vice President of Energy Policy at Associated Industries of Massachusetts (A.I.M.), the Commonwealth's principal statewide employer organization. In that capacity, since 2001, she represented the interests of A.I.M.'s 7,600 members, as energy customers, in a wide range of public, legislative, and regulatory activities. A.I.M. serves as a member of the Advisory Committee of ISO New England and is a voting member of NEPOOL. Most recently she educated the business community about the deregulated marketplace and, working with A.I.M.'s Energy Management Council, to help members take advantage of the emerging competitive retail market for electricity.

Before joining A.I.M., O'Connor was Operations Manager for Massachusetts Health and Educational Facilities Authority PowerOptions program, the largest energy purchasing consortium in New England, consisting of colleges and universities, hospitals, other non-profits, and municipalities. Her primary responsibility was educating the non-profit community about electricity issues and the offerings of the PowerOptions program.

In addition O'Connor has worked in marketing for the Boston Celtics, an environmental assistant to the City of Boston Environmental Department, and as a small business owner. She also served as chairman of the Board of Selectmen for the Town of Rockport.

Ms. O'Connor is an honors graduate of UMass-Boston.

KAREN O'REILLY

Karen O'Reilly is the Director of Product Development at the Lexington Insurance Company, a member company of AIU Holdings, Inc. As the Director of Product Development, Karen is responsible identifying market trends and managing the development and launch of new insurance products that meet changing market needs. Karen has been instrumental in the development of Lexington's expanding EcoSuranceSM product line of green insurance products. Prior to joining Lexington at the start of 2007, Karen served 10-years with AIG Environmental where she worked with brokers and clients to create insurance programs to address legacy environmental liabilities – particularly in the areas of brownfield and real estate redevelopment. Prior to her tenure at AIG Environmental, Karen served as a project manager and at Metcalf & Eddy, Inc., an international environmental consulting and engineering firm. Karen holds a B.S. degree from the State University of New York at Albany and an M.B.A. from Union College.

JOHN RAMSEY

Mr. Ramsey is a co-founder and Principal Coastal Engineer at Applied Coastal Research and Engineering, Inc. (Applied Coastal) and has served as Project Manager and/or Principal Investigator for coastal embayment restoration projects, regional shoreline management plans, beach nourishment and coastal structure designs, estuarine water quality/flushing studies, geotechnical engineering, hydrodynamic and sediment transport evaluations, and environmental studies required for permitting of coastal projects. Mr. Ramsey has over 20 years of coastal and geotechnical engineering experience and is a licensed Professional Engineer. He has co-authored several papers related to littoral processes analysis and has employed innovative numerical methods to develop alternative solutions for complex coastal engineering problems. Mr. Ramsey is well-versed in modern analytical and numerical techniques for evaluating coastal, estuarine, and salt marsh processes. In addition, he is responsible for oversight of engineering services at Applied Coastal.

JEFF READE

Mr. Reade is a wastewater treatment process specialist At AECOM, Inc. has 20 years of combined design, commissioning, and operating experience at both municipal and industrial wastewater treatment facilities. His areas of expertise include both aerobic and anaerobic biological processes, treatment plant and conveyance system hydraulics, process automation, and oxygen transfer. He has a proven track record with the application of control systems for plant optimization and with energy optimization and management. Mr. Reade's process optimization work is informed by his operational experience as the director of 70 operations and process support staff at Boston's 1,270 MGD Deer Island treatment plant. Mr. Reade has an MS in

Environmental Engineering from Worcester Polytechnic Institute and a BS in Chemical Engineering from Northeastern University.

ROBERT RIO

As Senior Vice President of Government Affairs for the Associated Industries of Massachusetts, Robert Rio does advocacy work on behalf of the organization's more than 7,000 member companies in energy matters, environmental, health and safety areas as well as public safety. Mr. Rio is also responsible for all chemical or product legislation, regulation or ballot questions. Mr. Rio's work includes both regulatory and legislative efforts. He has appeared on behalf of A.I.M. in regulatory matters concerning the Department of Environmental Protection, the Environmental Protection Agency, the Department of Public Safety, and the Mass Water Resources Authority and the Department of Public Utilities. He also represents A.I.M. as a member of several ongoing advisory groups within the Department of Environmental Protection, the New England Power Pool and other agencies, including various regulatory reform committees which has resulted in several changes to existing regulations to make them easier to comply with as well as less burdensome to industry. Mr. Rio joined A.I.M. in 1997 with an extensive background in industrial and regulatory areas. He has an undergraduate degree from Boston University, a Master's Degree from Northeastern University and received his law degree from Suffolk University in 1994.

HOWARD RIS

Howard (Bud) Ris was appointed President and CEO of the New England Aquarium in September, 2005. In that capacity, he oversees a staff of 250 and an annual budget approaching \$40 million. Long recognized as one of the leading Aquariums in the United States, the New England Aquarium attracts 1.3 million visitors annually to its innovative exhibits on Central Wharf in Boston. The institution's educational programs reach 150,000 school children annually. Its pioneering programs on marine conservation extend from the Gulf of Maine to the Pacific Ocean, where the Aquarium recently led a successful initiative to create the largest marine protected area in the world. The institution has a major program on sustainable seafood and leads the east coast consortium to protect the North Atlantic Right Whale. The Aquarium has major multi-year partnerships with a wide variety of institutions and businesses, including the Woods Hole Oceanographic Institution, the National Geographic Society, Ahold USA, Irving Oil, Gorton's Seafood, and New Balance.

From August 2004 to September 2005, Mr. Ris was a Senior Fellow in the Centre for Global Insight at the World Economic Forum (WEF) in Geneva, Switzerland. The WEF is one of the world's foremost business organizations, with more than 1,000 member companies. During his year at the WEF, Mr. Ris served as the primary liaison between the WEF and the UK Prime Minister's office on climate change policy. He led the creation of a climate change business advisory group for Prime Minister Blair that included chief executives from 25 global companies from 12 nations. Mr. Ris also advised the WEF on the design and implementation of a new program on global risks pertinent to the areas of science, technology, and the environment.

From 1984 through 2003, Mr. Ris served as the chief executive officer of the Union of Concerned Scientists (UCS), first as Executive Director, and then as President. UCS is nonprofit partnership of scientists and citizens whose mission is to achieve practical solutions to environmental and national security problems. UCS combines rigorous scientific analysis, citizen advocacy, outreach to corporations, and innovative policy development to achieve its goals. Under Mr. Ris's leadership, the scope and reach of UCS's work expanded significantly, leading to a number of precedent-setting laws and regulatory policies at the national level and in

many states throughout the U.S. The organization's staff grew tenfold to eighty people; its annual budget increased sevenfold to \$11 million; and its membership and activist base expanded to more than 100,000 people. Today, UCS is widely recognized for its scientific credibility and ground-breaking studies on topics such as the regional impacts of climate change, fuel-efficient designs for motor vehicles, the benefits of renewable energy, the use of antibiotics in animal agriculture, and protection of biodiversity.

From 1997 to 2003, Mr. Ris chaired a coalition of sixteen national organizations founded to support international and domestic action on climate change. He led the delegation of US NGO's to the international negotiations that culminated in the Kyoto Protocol. He served on the Energy and Transportation Task Force of President Clinton's Council on Sustainable Development and was a member of the Energy Future Coalition's advisory council from 2002-2003. He was co-chair of The Keystone Center from 2004-2007 and is currently a director of the Heinz Center for Science, Economics, and the Environment, Sea Education Association, and The Boston Harbor Association. He served on the board of Environment 2004, was an advisor to the Henry Luce Foundation and, until December 2003, was a member of the advisory board of the Institute of Transportation Studies at the University of California, Davis. Until the company was sold in 2000, Mr. Ris also served on the board of Ris Paper Company, Inc., one of the largest independent distributors of fine printing papers in the U.S.

In November of 2004, Mr. Ris was honored as a Fellow of the American Association for the Advancement of Science for his contributions in bringing good science to bear on the resolution of societal problems.

Prior to joining UCS in 1981, Mr. Ris directed the Hydroelectric Power Program at the New England River Basins Commission. From 1976-1978, he was a senior policy analyst in the Massachusetts Executive Office of Environmental Affairs, where he had major responsibility for preparing the state's first Coastal Zone Management Plan. Before then, he was a Senior Associate with Roy Mann Associates, a consulting firm specializing in environmental impact assessments for public and private sector clients involved in marine-related projects.

Mr. Ris has appeared as a keynote speaker before many of the nation's leading civic forums and often represented UCS as its senior spokesperson before the news media. He has appeared on hundreds of national and local news programs, ranging from CNN's *CrossFire* to NPR's *All Things Considered*, and published editorials in many of the nation's leading newspapers, ranging from the *New York Times* to the *LA Times*.

Mr. Ris received his B.A. in mathematics from Duke University in 1970 and a M.S./M.L.A. in landscape architecture and environmental planning from the SUNY College of Environmental Science at Syracuse University in 1974. He attended the Duke University School of Forestry (now the Nicholas School for the Environment) from 1971 to 1972.

ERIKA SPANGER-SEIGFRIED

Erika Spanger-Siegfried is the northeast climate project manager with the Union of Concerned Scientists (UCS). Since 2005, Ms. Spanger-Siegfried manages the Northeast Climate Impacts Assessment (NECIA), a collaboration between UCS and a multi-disciplinary team of more than 40 scientists from across the region committed to exploring future global warming in the Northeast states and the impacts of climate change on key sectors. By combining state-of-the-art analyses with effective outreach, the NECIA aims to provide opinion leaders, policymakers, and the public with the best available science upon which to base informed choices about climate change mitigation and adaptation. Prior to joining UCS, Ms. Spanger-Siegfried was an

associate scientist at the Boston Center of the Stockholm Environment Institute, where for six years she helped lead its work to assist developing countries in assessing and reducing vulnerabilities to climate change. With support from the United Nations Environment Programme, United Nations Development Programme, and others, this work focused on understanding and building coping and adaptive capacity among highly vulnerable populations in Sudan, India, and Southeast Asia. Earlier in her career, Ms. Spanger-Siegfried worked with the Harvard Center for Health and the Global Environment and the Massachusetts Department of Public Health's Environmental Laboratories. She has a master's degree in energy and environmental analysis from Boston University and a bachelor's degree in fisheries biology from the University of Massachusetts at Amherst.

CARL SPECTOR

As Executive Director of the City of Boston's Air Pollution Control Commission, Carl Spector enforces the City's air and noise regulations and coordinates climate mitigation and adaptation policies. Before joining City Hall, he worked on a wide variety of environmental and energy issues at the U.S. Environmental Protection Agency, the U.S. General Accounting Office, and the Massachusetts Water Resources Authority, and in private industry. He holds degrees in physics and environmental science.

TAMARA SMALL

Tamara Small serves as the Director of Policy and Public Affairs for National Association of Industrial and Office Properties – Massachusetts (NAIOP), the Commercial Real Estate Development Association. In this position, she advocates on behalf of the commercial real estate industry and ensures that the organization is actively involved in the development of laws and regulations affecting development in Massachusetts. Tamara advances NAIOP's agenda through participation on task forces and committees on critical policy issues and she regularly testifies before the Legislature on proposed laws affecting economic development. Prior to joining NAIOP in 2004, Tamara managed policy and press issues for a New York trade association representing affordable housing developers. In addition, Tamara gained extensive experience in community relations, crisis communications and public affairs while at several prominent Boston and Paris based agencies. Tamara is a graduate of Boston University.

ALEXANDER TAFT

Sandy Taft is an environmental professional with 22 years of experience, serving the first three years in the consulting industry for Haley & Aldrich, Inc. (a Cambridge Massachusetts based environmental and geotechnical consulting firm) and the last 19 in the utility industry. This work included serving as the Director of Environmental Management for Boston Gas Company and then for KeySpan Energy Delivery's New England Territory. With the acquisition of KeySpan by National Grid, Sandy was named Director US Climate Change Policy and is now focusing on the implementation of National Grid's US Climate Change Initiatives in the United States.

Sandy is a past Chair of the American Gas Association's Environmental Matters Committee. Presently, Sandy is representing National Grid on the New Hampshire Corporate Wetlands Restoration Partnership and is serving as Treasurer.

He is presently serving on the New York City Climate Change Adaptation Energy Working group, the New York State Sea Level Rise Energy Working Group (Chair) and the New York State Adaptation Energy Working Group. He also co-chairs a National Grid Adaptation Task Force Team that is looking at Adaptation issues for the company in both the US and the UK.

Sandy has a Bachelor of Science degree in Geology from St. Lawrence University and a Master of Science in Geology from Kent State University.

PETER WEISKEL, PH.D.

A hydrologist with the U.S. Geological Survey, Dr. Weiskel presently serves as Associate Director of the USGS Massachusetts-Rhode Island Water Science Center where he oversees the scientific program. Trained in geology, with degrees from Yale, Boston College, and Boston University, his research over the past 20 years has addressed coastal and urban hydrology, and the effects of water use, land-use, and climate change on the terrestrial water balance.

NORMAN WILLARD

Norman Willard is with U.S. EPA New England's Energy and Climate Unit and has been working on climate and energy issues in the regional office since the middle 1990's.

His climate work began on the international level as part of the multi-agency U.S. Country Studies program to increase technical capacity on climate change in developing countries. Following that, he was engaged on the regional level with the New England Governors/Eastern Canadian Premiers Climate Action Plan process, and directly with state agencies, local governments, colleges and universities, not for profits, research institutions, and the public. Most of this work focused on climate science and mitigation, outreach and education, energy efficiency and clean energy, and supporting state and local emission inventories and climate action plan implementation. More recently, he has been involved in vulnerability assessment and adaptation activities. He participates in Connecticut's statewide adaptation planning group, the New England federal agency adaptation workgroup, and the NESCAUM-convened regional organization adaptation group. At this time, EPA New England is undertaking and supporting projects to identify and plan for climate impacts, particularly as they relate to 1) the built infrastructure and 2) coastal resources.

ROBERT ZIMMERMAN, JR.

Robert Zimmerman, Jr., is the Executive Director of the Charles River Watershed Association. Founded in 1965, CRWA is a private nonprofit environmental advocacy, research, and education group charged with using science and the law to protect and enhance the Charles River and its watershed. Since joining CRWA in 1991, Zimmerman has raised public and regulatory awareness of issues on the Charles and increased membership from 600 to 6000. Over the past fifteen years, CRWA has become a leading authority on the science of how water works in urban watersheds, and has developed pilot projects that address issues such as stormwater pollution, water quality, low instream flow, nutrient loading, habitat protection and restoration, zoning, suburban sprawl, and sustainable development. CRWA has also led initiatives that reformed Massachusetts' park and open space agencies, that protected essential urban parkland while fundamentally changing the state process used to dispose of protected open space, and that through litigation led to the revisions of regulation that protect water resources.

A leader in the state's environmental community, Zimmerman has been appointed by four governors to the Massachusetts Water Resources Commission, and he represents the environmental community on several

statewide task forces. He is serving or has served on numerous boards, including River Network, EarthShare of New England, EarthShare America, and the MIT Sea Grant Advisory Board. He also served two terms as an elected member of the Littleton, Massachusetts, Board of Health.

Prior to working at CRWA, he co-founded and was the Headmaster of the National Sports Academy at Lake Placid, a boarding school offering a complete preparatory curriculum and world-class training programs for winter sports athletes.